

*ENVIRONMENTAL ASSESSMENT
OF THE
OPERATION AND MAINTENANCE
OF*

FRANKLIN FALLS DAM

PEMIGEWASSET RIVER

FRANKLIN, NEW HAMPSHIRE

Prepared by



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SEPTEMBER 1973

Preface

The purpose of this Environmental Assessment is to provide the basis for evaluation of the environmental impact on the project area due to the routine operation and maintenance of this flood control reservoir. Franklin Falls Dam has been operated whenever necessary since it was constructed to prevent or reduce downstream flooding. Maintenance and management of the project, including the recreation facilities, during non-flood periods is also of primary importance. Enhancement of the fish and wildlife resources as well as protection of the environment within and around the reservoir area has been given careful consideration.

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I. PROJECT DESCRIPTION

A. Introduction

Franklin Falls Dam is located on the Pemigewasset River, the main tributary of the Merrimack River, about 2.5 miles upstream from the city of Franklin in Merrimack County, New Hampshire. Authorization for the project is from the Flood Control Act of 22 June, 1936 (Public Law 738, 74th Congress) modified by the Flood Control Act of 28 June, 1938 (Public Law 761, 75th Congress) as part of a flood control system for the Merrimack River Basin. The dam was completed in October, 1943.

Reservoir land comprises approximately 3,704 acres. The project has a total storage capacity of 154,000 acre-feet equivalent to 2.9 inches of runoff from its 1,000 square mile drainage area.

Franklin Falls Dam is operated in conjunction with four other flood control reservoirs in the Merrimack River Basin. These are Hopkinton and Everett Lakes on the Contoocook and Piscataquog Rivers, Blackwater Dam on the Blackwater River and Edward MacDowell Dam on Nubanneit Brook.

B. Description of Structures

1) Dam: The dam consists of a rolled-earth embankment 1,740 feet in length with protective rock shell. This dam rises 140 feet above the streambed to a top elevation of 416 feet m.s.l. The top width is 35.0 feet.

2) Spillway: The chute spillway, located along the westerly abutment of the dam, has a crest at elevation 389.0 feet m.s.l. The concrete ogee weir is 550 feet long.

3) Outlet Works: The outlet works consist of twin horseshoe-shaped conduits regulated by eight cable operated Broome gates. The elevation of all gate sills is 300.0 feet m.s.l. The total discharge capacity of the gates with the pool at elevation 389.0 is approximately 42,500 cfs. However, the maximum non-damaging downstream channel capacity is about 18,000 cfs.

4) Water Storage: The reservoir when filled to spillway crest would flood about 3,000 acres of land and extend upstream about twelve miles to Ayer's Island Dam. During normal conditions a 7-foot deep permanent pool of about 3,000 acre feet is formed from the backwater of Eastman Falls Dam, which is located about 1.5 miles downstream.

C. Operation Procedures

Reservoir management and operation functions are performed by the Reservoir Control Center (RCC), which is a section within the Water Control Branch of the Engineering Division. In addition other sections of the Water Control Branch including the Hydrologic Engineering, Hydraulics, and Water Quality sections assist the RCC during flood operations and provide technical assistance as required. The RCC, which is staffed by hydrologic engineers, is divided into basin units, each responsible for receiving hydrometeorological reports and directing reservoir regulation within the basin. Each unit consists of a regulator in charge of the overall operation of the basin, and project regulators who receive reports and issue instructions to individual dams.

During normal (non-flood) periods the gates are completely open because of the desirability to quickly develop a high rate of discharge during the early period of a flood to minimize utilization of storage. For minor increases in flow the reservoir will act as a simple retarding basin even when the gates are in a fully open position. Experience has shown that no serious difficulties in gate operation occur at Franklin Falls during the winter months with normal low pools.

During flood periods Franklin Falls is regulated as part of a reservoir system to maintain flows within the safe channel capacity of the Merrimack River. Because the storage capacity at Franklin is limited, it is necessary to coordinate the rate of discharge with the volume of expected flood runoff. Attempts to store the entire flood runoff, similar to operation at other projects with greater storage, could result in completely filling the reservoir during the early or middle phases of a flood leading eventually to damaging spillway discharges. Hydrologic studies of past floods have shown that it is essential to release water continuously in order to utilize the reservoir storage most expeditiously and to avoid uncontrolled spillway discharges. Optimum regulation requires accurate runoff forecasting to determine the magnitude of the flood during its development.

The regulation at Franklin Falls Reservoir is classified into three phases:

1) Telemetering gaging stations on the Baker River at Rumney and on the Pemigewasset River at Woodstock provide data relative to the magnitude of the flood. The discharge will initially be regulated at a rate of 18,000 cfs dependent, however, upon storm rainfall, snowpack, time of year as well as other climatologic and hydrologic conditions.

2) If the flood is expected to exceed the safe downstream channel capacities on the Merrimack River the outflow may be modified in accordance with established guide curves.

3) Following the recession of the flood, the reservoir will be emptied as rapidly as possible without exceeding downstream channel capacities.

D. Management Programs

The New Hampshire Department of Resources and Economic Development holds a 25 year lease for management of recreation, fish, wildlife, and forestry resources on about 3,470 acres of land (94% of the project acreage) upstream of the dam. Since issuance of the lease, on 15 July, 1960, that agency has made an extensive survey of the woodlands, mapped and typed the area, instituted improved silvicultural practices and carried on a selective timber harvesting program. Some existing roads have been improved and new roads constructed.

Fish and wildlife programs have been in operation for a number of years. The Pemigewasset has been stocked previously with walleyed pike. The Smith River and Prescott Brook are annually stocked with brook and rainbow trout. A pheasant stocking program is conducted yearly and the number of birds released has recently been increased.

Recreational developments have been minimal. Trash removal and minor road maintenance are accomplished yearly. A small gravel parking area, which can accommodate six to eight cars, has been constructed at Profile Falls. Two boat launches are proposed for development in the near future.

Two Corps managed picnic areas are located within the project. One area is located at the overlook near the dam and consists of two picnic tables with fireplaces and two pit toilets. The Wayside Picnic area, also located off Route 3A, consists of four picnic tables with fireplaces and two pit toilets.

II. ENVIRONMENTAL SETTING

A. Description of General Area

1) Watershed: Franklin Falls Reservoir lies within a narrow section of the Pemigewasset River Valley characterized by steep sided hills and gently sloped bottom lands. During periods of normal flow, the river meanders along the valley floor with a slope of about six feet per mile. Portions of the gentler slopes and flat lands have been cleared by former owners for agricultural purposes. The remainder of the area is heavily wooded.

2) Climate and Rainfall: The climate of the area is variable with a mean annual temperature of 45° F. The average monthly temperature varies from 70° F in July to about 20° F in January. The mean annual precipitation is about 41 inches and is uniformly distributed throughout the year. The average annual snowfall, which usually occurs between November and April, is about 72 inches. The growing season averages about 160 days.

3) Water Quality: The Pemigewasset River meanders approximately 15 miles through the project. The water quality of the Pemigewasset River is designated primarily as Class B with the exception of a short section downstream of Woodstock which is Class C.

Class B waters, according to New Hampshire Water Quality Standards, shall have no objectionable physical characteristics, shall be near saturation for dissolved oxygen (not less than 75%) and contain not more than 240 coliform bacteria per 100 milliliters. There shall be no disposal of sewage or waste into Class B waters without adequate treatment. The pH range shall be 6.5 to 8.0, except when due to natural causes. Any stream temperature increase associated with waste discharge shall not impair any usage specifically assigned to B-class waters.

Class C waters shall be free from slick, odors, turbidity and surface-floating solids of unreasonable kind or quantity and chemicals or other materials and conditions inimical to fish life or the maintenance of fish life. They shall contain not less than 5 parts per million of dissolved oxygen and shall have a pH range between 6.0 to 8.5, except when due to natural causes.

Data collected by the New Hampshire Water Supply and Pollution Control Commission between 1951 and 1972 at three stations upstream and one station at Franklin Falls Dam show that the river was formerly grossly polluted from both municipal and industrial wastes. Installation of secondary treatment facilities in New Hampton (1965), Lincoln (1968), Ashland and Plymouth (1969), and Woodstock and Bristol (1970) have contributed to the improvement in water quality noted between 1970 - 1972.

The Franconia Manufacturing Company in Lincoln, formerly a major source of industrial pollution, has not been in continuous operation since July 1970 and at present is closed down. Cessation of pulp manufacturing and subsequent cleansing of the river through natural flushing have been significant factors in recent water quality improvement.

Water samples collected in recent years (1970 - 1972) showed that dissolved oxygen and percent saturation are within acceptable limits of Class B waters. Values for pH (yearly average) range between 6.4 and 7.6 with most values ranging between 6.4 and 6.6. Coliform bacteria per 100 ml range between 93 and 465. Yearly average coliform counts were higher than the acceptable 240 at all four stations in 1971. State fishery biologists noted (1972) evidence of siltation in the lower pool (at Eastman Falls Dam) due to water fluctuations from Ayers Island Dam hydro-electric operations.

4) Soils: The principal soil series within the project area are Windsor and Hinckley but Ondawa and Shapleigh are also present. Windsor soils are deep, sandy, and excessively drained with little or no gravel. These soils occur on nearly level sandy plains, gently sloping to moderately sloping terraces, and very steep terrace escarpments. Windsor soils are strongly acidic and were developed in water-sorted and wind-deposited sand. Water moves through them quite rapidly and little moisture is available to plants.

Hinckley soils are also deep, droughty and excessively drained and occur on level plains and gently sloping to very steep terrace escarpments. They are developed in water-sorted sand and gravel. Movement of water is very rapid through these soils and their moisture holding capacity is very low. Hinckley soils are strongly acidic.

Ondawa series are well-drained, moderately coarse textured soils found on flood plains within the project area. They are medium acid soils. Water moves through this series rapidly, but enough moisture is available for plants during the growing season.

Shapleigh series are somewhat excessively drained, shallow, strongly acid soils which developed in glacial till. These soils occur on the tops and sides of gently sloping to steep hills. Stones and boulders occur throughout the profile. The texture of the surface is sandy loam. Water moves through rapidly, leaving inadequate amounts of moisture available for plants during dry periods.

5) Vegetative Cover Types: There are approximately 2,512 acres of woodland and more than 800 acres of open and pasture land within the project. Forest cover is predominantly softwood consisting of white pine, red pine, hemlock and some red spruce. Associated hardwoods include sugar, red and silver maple, elm, aspen and alder.

6) Fish and Wildlife: In 1971, personnel from the New Hampshire Fish and Game Department sampled fish populations in the Pemigewasset River from Eastman Falls Dam to Ayers Island Dam. Fyke netting resulted in 9 different species captured totaling 2,753 individuals and weighing about 802 pounds (Table 2). Golden shinner, yellow perch, brown bullhead and white sucker comprised almost 94% of the total catch.

TABLE 2. RESULTS OF FISH SAMPLING PROGRAM CONDUCTED BY NEW HAMPSHIRE FISH & GAME DEPARTMENT
ON THE PEMIGEWASSET RIVER FROM EASTMAN FALLS DAM TO AYERS ISLAND DAM, 1971

| SPECIES | NUMBER | PERCENTAGE OF CATCH | WEIGHT | AVERAGE WEIGHT |
|-----------------|--------|---------------------|--------|----------------|
| Chain pickerel | 22 | 0.79 | 20.4 | 0.92 |
| Yellow perch | 775 | 28.15 | 89.5 | 0.11 |
| Smallmouth bass | 6 | 0.21 | 1.2 | 0.20 |
| Pumpkinseed | 110 | 3.99 | 20.8 | 0.19 |
| White sucker | 461 | 16.74 | 453.4 | 0.98 |
| Yellow bullhead | 29 | 1.05 | 11.8 | 0.40 |
| Brown bullhead | 536 | 19.46 | 111.1 | 0.20 |
| Fallfish | 10 | 0.36 | 5.1 | 0.51 |
| Golden shiner | 804 | 29.20 | 88.6 | 0.11 |
| Grand Total | 2,753 | 99.95 | 801.9 | |

Tributary streams that flow through the reservoir provide excellent trout habitat and are stocked with rainbow and brook trout. In the past, brown trout were stocked in certain of the tributary streams within the project.

Project lands provide big-game habitat primarily for white tail deer, but moose and black bear occasionally pass through the area. The deer population within the general area is in good condition. Fur-bearing species in the vicinity include beaver, mink, otter, fisher, muskrat, raccoon, and red and gray fox. In recent years no trapping permits have been issued by project personnel.

Some wood duck, mallard, hooded merganser and black duck do breed in the area, although the project does not contain quality waterfowl habitat. The river is utilized by migrating ducks and geese during both spring and fall flights.

In general, there is moderate to heavy hunting pressure for all species.

7) Socio-economic Conditions: Franklin Falls Reservoir is located in south central New Hampshire in close proximity to the industrial and population centers of the state. The lower Merrimack Valley has become highly developed industrially, with textiles, leather goods, and wood products being manufactured. Agriculture accounts for only a small portion of the occupational activity of the region and consists principally of dairy and poultry farming and fruit and truck gardening.

This project is accessible from Interstate 93 and U.S. Route 3 which pass within two miles of the reservoir. The White Mountain National Forest, about 27 miles to the north, attracts sightseers, campers, mountain climbers, skiers, fishermen, and hunters from considerable distances.

Franklin Falls and Blackwater Dams are 10 miles apart and as such they serve approximately the same region. Thus, a common zone of influence, covering a radius of 40 miles centered midway between the two reservoirs, has been established. A major portion of the population in New Hampshire lives within this 40 mile zone.

B. Water Uses

The principal uses of the river in the project area are for recreational activities which include canoeing, fishing, and waterfowl hunting.

Eastman Falls Dam, a power dam in Franklin, lies 1.5 miles downstream of the project and is responsible for maintaining the "pool" behind Franklin Falls Dam.

III. ENVIRONMENTAL IMPACTS OF THE PROJECT

A. Operation of Project

1) Downstream Effects: The reservoir is operated whenever it is expected that flood stages will be exceeded on the Merrimack River. An estimated \$15,660,000 in damages to downstream properties has been prevented through February 28, 1973. Benefits of flood control are also provided to flood plain vegetation and timber as well as fish and wildlife species.

Extensive flood control operations were undertaken in July, 1973. Preliminary estimates are that \$3,000,000 in damages to properties were prevented within the Merrimack River Basin. Flood waters were held for about two weeks and at the height of the flooding the reservoir was at approximately 65 percent of total capacity with the water level only twenty feet below spillway crest.

2) Upstream Effects:

a) Vegetative Cover and Timber: Trees in the flood pool area are periodically inundated. Review of the records from 1972 to 1960 indicates that flood pools have been sustained primarily in April and May for average periods of 10 - 14 days. Some flooding has occurred during March with high water lasting for about 5 days. Minor flooding sometimes has been encountered during the winter months of January, February, November, and December and also during late summer and early fall (August, September, and October) with high water held for an average of only 2 - 3 days. Examination of the reservoir area revealed no tree or vegetation mortality zones which could be attributed to flooding. The time of flooding usually occurs during the dormant season with the result that trees suffer little or no injury.

An exception to this was the flooding of July 1973 in which a layer of fine sediment was deposited on the surfaces of a good percentage of the plants within the project. The combination of inundation during the growing season plus sediment deposition on the plants will probably cause damage or mortality to certain species. Many of the smaller trees as well as shrubs and ground vegetation along the river were covered completely with water whereas some of the larger trees and those at higher elevations were only partially flooded. Many of the affected trees have already begun to drop their leaves.

The deposition of sediment and odors of decaying organic matter and sewage reduced the aesthetic and recreational potential of the project. No major embankment slumping resulted from project operations although a number of small slides did occur.

b) Fish and Wildlife: Periodic flooding may cause some mortality to certain fur-bearing species and upland birds and mammals, especially if it occurs during the breeding season. It is not possible to determine the specific effects of flooding on population dynamics of local species without an intensive study. However, due to the relatively low storage capacity of this project, it is felt that long-term effects on populations in the area at large are minor.

Preliminary investigation of the area after the July 1973 flood operation uncovered several bodies of drowned rodents (chipmunks) as well as aquatic species (fish, crayfish, tadpoles) stranded in small flood pools along Route 3A (old route). Substantial numbers of earthworms were evident in pools of water along project roads.

B. Construction and Maintenance of Project Facilities

Weed and Brush Control

Plant control programs are concerned primarily with weed control on the dam and the spillway. This is accomplished with the following herbicides:

| <u>Herbicide</u> | <u>Control of</u> | <u>Rate of Application*</u> |
|------------------|---------------------|---------------------------------------------------------|
| 2, 4-D | broadleaf and brush | 3 quarts Banvil and 1 gallon 2, 4-D/200 gal. water/acre |
| Simazine | all species | 50 lbs. (granular)/acre |

*Manufacturer's suggested rate of application

Liquid herbicides are applied with a motorized sprayer and granular material with a hand spreader. While it would be difficult to assess the total environmental effects of the plant control program, it is probable that adverse impacts are minimal, if any.

C. Management of Project Lands

1) Agricultural Leasing Program: Approximately 841 acres of land are available for lease for pasture and hay production. Pasture areas are fenced to prevent escape of livestock and to reduce pollution of tributary streams and the main river from animal feces. Most pasture and hayfields are in good condition. The agriculture leases are responsible for maintaining the open areas and fields, which would otherwise undergo natural succession to brush and forest cover. It was observed that brush and trees are encroaching in some areas because the sites are not under an

active lease. It is desirable from the standpoint of aesthetics, recreation and wildlife management to perpetuate these open areas. The New Hampshire Fish and Game Department is considering cutting brush and mowing as techniques for retarding natural plant succession should the leasing program prove inadequate.

2) Fish and Wildlife Management: There is an active pheasant stocking program at this project. Recent stocking is outlined below:

| <u>Year</u> | <u>Number Stocked</u> |
|-------------|-----------------------|
| 1972 | 1063 |
| 1971 | 519 |
| 1970 | 119 |
| 1969 | 86 |
| 1968 | 102 |
| 1967 | 121 |
| 1966 | 156 |

The "put and take" pheasant program is not particularly popular with State Fish and Game personnel, but it appears that sportsmen pressure is significant enough to insure that it will be continued. Numbers of birds were significantly increased in the past two years.

Brook and rainbow trout (yearlings) are stocked annually in Prescott Brook and the Smith River. Recent stocking levels are shown below:

| <u>Site</u> | <u>Year</u> | <u>Number Stocked</u> | |
|----------------|-------------|-----------------------|----------------------|
| | | <u>Brook Trout</u> | <u>Rainbow Trout</u> |
| Prescott Brook | 1972 | 1000 | |
| | 1971 | 1250 | |
| Smith River | 1972 | 6900 | 2600 |
| | 1971 | 7400 | 2900 |

3) Forestry Management: Initial work of the forest management program involved marking the project boundaries and implementing an "extensive" timber survey to determine species composition and general condition of the timber stands. In addition, the project area has been classified, on a preliminary basis only, into land-use zones based on the following categories: 1) resource area; 2) scenic area; 3) historical area; 4) natural reserve area; 5) timber management area; and 6) water resource area. Areas are assigned on the basis of the highest estimated value of the site resources and timber management practices are adjusted accordingly. The road system in the project area has been extended as a result of timber harvesting activities. This system is beneficial not only to forest management, but to fire protection, and recreational activities as well. However, the extensive series of roads increases the problems of law enforcement and litter removal.

The forestry program has been in operation for 12 years. Yearly activities, including timber sales, road construction, timber stand improvement (TSI) work, bank stabilization, and related improvement programs, are presented in Table 3.

Money derived from stumpage sales has been used to finance trash removal, boundary marking, road building and maintenance, blister rust control and timber stand improvement such as thinning, pruning, weeding, etc. All timber harvesting with the exception of the bank stabilization operations has been on a selective basis with the result that after a few years, it is difficult for the

TABLE 3. SUMMARY OF FOREST MANAGEMENT PROGRAM
AT FRANKLIN FALLS FLOOD CONTROL RESERVOIR FROM 1962 - 1972

| YEAR | TIMBER HARVESTED | NET INCOME (DOLLARS) THROUGH END OF YEAR | NUMBER OF MILES OF ROAD IMPROVEMENT | RELATED IMPROVEMENT PROGRAMS |
|------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1972 | | - \$2,290.60 | | seeded undetermined no. of skid roads and landing areas 15 acres of white pine were thinned, pruned and weeded construction of graveled parking area (6-8 cars) at Profile Falls and a foot trail from the parking area to the falls |
| 1971 | 21,000 board feet sawlogs 56.53 cords white pine pulpwood 274,689 board feet white pine sawlogs | \$5,328.02 | 3.4 (included ditching, graveling, installation of culverts, and bridge repair) | |
| 1970 | | \$ 139.01 | | white pine stand was marked for thinning |

continued

TABLE 3 (cont.).

| YEAR | TIMBER HARVESTED | NET INCOME (DOLLARS) THROUGH END OF YEAR | NUMBER OF MILES OF ROAD IMPROVEMENT | RELATED IMPROVEMENT PROGRAMS |
|------|------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 1969 | | - \$1,171.39 | minor road main- tenance on undetermined no. of miles (brush and debris removal) | approximately 6 miles of project boundary were marked |
| 1968 | | - \$1,159.61 | | some boundary marking was accomplished |
| 1967 | | - \$2,748.96 | minor road main- tenance | approximately 12.4 miles of project boundary were marked |
| 1966 | 182,510 board feet white pine, hemlock,oak,and birch stumpage | \$2,889.57 | minor road main- tenance (culvert cleaning) | small area of softwood was weeded |
| 1965 | 90 cords pine pulp; 73 cords popular;8020 board feet sawlogs | - \$3,556.80 | road maintenance on 18.25 miles | 0.23 miles of boundary were marked 10 acres of white pine were thinned lopping and scattering of slash on 125 acres |

continued

TABLE 3 (cont.).

| YEAR | TIMBER HARVESTED | NET INCOME (DOLLARS) THROUGH END OF YEAR | NUMBER OF MILES OF ROAD IMPROVEMENT | RELATED IMPROVEMENT PROGRAMS |
|------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1965 | 340,860 board feet white pine 16,405 board feet hemlock | | | brush and tree removal along 3,200 feet of slumping river bank |
| 1964 | 4,860 board feet hardwood | - \$1,566.25 | general maintenance on all roads | 3.75 miles of boundary were marked Pruning, thinning, and weeding of 38 acres of white pine blister rust control on approximately 2,774 acres timber harvest along badly slumped river banks |
| 1963 | 557,685 board feet white pine logs 10,820 board feet softwood logs 510 board feet hardwood logs | \$3,390.49 | | some boundary marking was accomplished 5,000 white pine seedlings were planted tree removal along badly slumped river banks |

continued

TABLE 3 (cont.).

| YEAR | TIMBER HARVESTED | NET INCOME (DOLLARS) THROUGH END OF YEAR | NUMBER OF MILES OF ROAD IMPROVEMENT | RELATED IMPROVEMENT PROGRAMS |
|------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1962 | 512,135 board feet white pine logs 27,815 board feet softwood logs 6,170 board feet hardwood logs 50,900 board feet mixed logs | \$3,925.67 | | 10 acre tract marked for harvest 500,000 board feet white pine marked for harvest 6 acre tract of white pine was thinned some boundary marking was accomplished |

public to identify areas which have been previously harvested. Cutting has opened up the forest lands and has provided additional food, cover, and habitat diversity for game and non-game birds and mammals. Thinning, pruning, and weeding have increased the aesthetic and recreational characteristics of the area as well as benefiting the timber stand itself.

Logging operations have been carried out on approximately 250 acres of badly slumped river embankments. All of the larger trees were removed which had the effect of reducing soil movement (through weight elimination) as well as encouraging the growth of grasses and brush which helped stabilize the bank areas. Tree removal on such terrain proved to be a difficult task and consequently rather costly. At best timber harvest on these slopes was accomplished on a break-even basis.

D. Recreational Use and Management

Annual attendance at Franklin Falls Dam from 1963 - 1972 is presented in Table 4. Between the years 1964 - 1966 annual attendance remained fairly stable. A slight increase was noted in 1967 but numbers were comparable in 1968. There was a substantial increase in attendance in 1969, 1971, and 1972.

Fishing and hunting have maintained fairly stable trends although fluctuations between successive years have varied considerably depending primarily upon weather conditions. Sightseeing has increased moderately since 1966. Boating has shown a fairly substantial increase since 1967 and probably will continue in the future as the water quality of the Pemigewasset River continues to improve. The river is used primarily by canoeists at present because of the lack of adequate boat-launch sites. Establishment of boat launches (which are under consideration) on each side

TABLE 4. ANNUAL ATTENDANCE AT THE FRANKLIN FALLS DAM FLOOD CONTROL PROJECT FROM 1963 - 1972

| FACILITY UTILIZED | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Vicinity of Dam | 11,536 | 10,168 | 8,703 | 9,027 | 9,678 | 11,244 | 13,878 | 11,631 | 10,065 | 13,311 |
| West Abutment Overlook | 13,584 | 10,539 | 11,020 | 9,772 | 11,933 | 10,154 | 13,719 | 14,218 | 16,941 | 18,203 |
| Picnic Areas | 7,378 | 5,670 | 4,800 | 4,500 | 4,080 | 3,439 | 3,395 | 3,650 | 4,200 | 5,805 |
| Reservoir Area | 4,800 | 5,000 | 6,350 | 6,375 | 7,434 | 8,675 | 10,356 | 13,129 | 19,626 | 27,050 |
| TOTAL | 37,298 | 31,377 | 30,873 | 29,674 | 33,125 | 33,512 | 41,348 | 42,628 | 50,832 | 64,369 |

of the river will no doubt increase the usage of motorized boats. Picnicking has tremendously increased from 1967 through 1972. Picnic facilities are minimal and additional tables and fireplaces would be well utilized. Skiing has more than doubled between 1971 and 1972. With the current interest in cross-country skiing increasing this activity will become more and more important at this project. Snowmobiling has increased from 300 - 400 in 1969 to over 6,500 in 1972. With increasing restrictions on the use of snowmobiles on private lands, the importance of public land for this activity will continue to increase.

The majority of the recreational usage at this project is from local area residents. Litter and vandalism are the most important problems associated with recreation but cannot be identified with a particular activity. Motorcyclists use the project but ride primarily on the roads. However, trail and minibikes are used and this activity can cause vegetation damage and soil erosion on steeper slopes.

IV. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

A. Fish and Wildlife

There are certain basic problems associated with fish and wildlife management in a flood control project because of water-level fluctuations which may occur at any time during the year. The period of maximum water-level instability usually occurs during the spring and may coincide with the reproductive season of many bird and mammal species.

B. Timber and Vegetative Cover

There is an ever-present possibility of mortality to trees, shrubs, and other vegetation if flooding and back-up of water occur after the growing season begins such as in 1973. Most trees suffer no adverse effects from flooding during the dormant season. However, once actively growing, many species may be readily killed or damaged if flooded for long. Trees which are entirely inundated are often killed and thus seedlings and younger trees are more apt to be damaged than mature trees. Trees weakened and injured from flood damage are more prone to attack by pathogenic organisms and insects and may succumb at a later date. Most hardwood species will not survive floodings beyond two to three weeks during the growing season. In general, conifers are more adversely affected by flooding than deciduous trees.

C. Bank Erosion

Substantial bank erosion has occurred in previous years (primarily 1953) as a result of major flood control operations. At the present time these slump areas have been stabilized as a result of removal of the larger trees combined with the natural growth of grasses, shrubs and stands of aspen and birch. It is possible, however, that back-up of flood waters in the future may cause additional soil movement on some of the unstable embankment areas such as occurred in July 1973.

V. ALTERNATIVES TO THE OPERATION AND MAINTENANCE PROGRAM

A. Multiple-Use Management

It is believed that management of the project resources on a multiple-use basis will provide the greatest benefits to the largest numbers of people. Selective logging operations provide benefits for wildlife, aesthetics, and recreation, as well as the timber stand itself. Agricultural leases provide a means of benefiting the local economy and at the same time help to preserve the open areas within the project which are also important for wildlife, recreation, and aesthetics. Hunting and fishing opportunities not only provide recreational benefits, but are also necessary to help maintain populations within the limits of habitat carrying capacity.

B. Forest Management

At present the Franklin Falls project is maintained in a semi-primitive manner with only minimal recreational development. Logging operations and TSI programs have been conducted conscientiously with the result that after a few years it is difficult for the average person to realize that timber harvesting has occurred. Buffer zones have been left along roads and the Pemigewasset River so that hikers, motorists, and canoeists are hardly even aware of existing timber harvesting operations. Removal of the larger trees on unstable embankment and slump areas has enabled understory vegetation and smaller trees to become established. This plant cover has helped to hold the soil during heavy rains, spring runoff and

flood control operations. It is felt that the forestry program is consistent with sound land-use management because of benefits to the watershed, fish and wildlife management, fire protection, aesthetics and recreation.

C. Recreational Management

It is desirable for development of future recreational programs to have reliable statistics regarding past and current recreational demands. Knowledge of who uses the projects, where they come from, and what types of activities they engage in are basic requirements. Project personnel have only minimal time in which to take sample counts for estimates of numbers per activity. While accurate statistics are needed, it is evident that collection of this information is time consuming and presents increased demands on already heavy work loads.

Water quality of the Pemigewasset River has improved considerably over the last few years. This improvement will no doubt increase the recreational use at the project. Two primitive boat launch sites have been proposed (one on each side of the river) between Thompson and Shaw Coves. It is recommended that these boat access sites be developed as soon as possible in the interest of public safety. A well-designed boat launch will also minimize bank erosion which could result from indiscriminate attempts at launching boats at various points along the river.

Installation of boat launching facilities combined with improved

fishing opportunities will no doubt increase the usage of motorized boats on the river. It is felt that some restrictions on the use of outboard motors is desirable. Fish and Game biologists (both State and Federal) indicate that motors are helpful in obtaining adequate fish harvest.

The problem, therefore, is to allow for the use of motors by fishermen, but prevent fast boating and water skiing which are disruptive to fishing, canoeing, etc. and could be dangerous on this river. The current trend regarding management of federal waters from the standpoint of the Bureau of Sport Fisheries and Wildlife is to create and maintain a "quiet and relaxing" atmosphere. The major difficulty concerning boating regulations will be enforcement, which will come under the jurisdiction of those towns within which portions of the project exist. The following restrictions have been suggested as possibilities: 1) wake limitation; 2) speed limitation; 3) horsepower limitation; and 4) prohibition of water skiing. It is believed that enforcement of wake and speed limitations would be difficult at Franklin Falls. Restrictions on horsepower and prohibition of water skiing is probably a more practical approach.

During the course of this study, various persons have indicated that publicizing (local radio, newspapers, etc.) regulations would be of benefit to local residents who may not know what is or is not allowed within the project. There are increasing numbers of persons who ride minibikes and camp indiscriminately throughout the area and who may not be aware of the restrictions against these activities. Boating regulations should be designated at each of the launch sites.

VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT
AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

At the present time there are minimal developed recreational facilities at Franklin Falls Dam. Differences of opinion regarding recreational development exist among state and federal personnel vested with the responsibility of managing the area as well as local residents in nearby towns. Some believe that the best use of the project lies in maintaining a semi-primitive atmosphere which will be utilized by hikers, hunters, fishermen, canoeists, etc. Others feel that developed day-use and camping areas would best serve the public interest. Currently, neither the Corps of Engineers nor the State of New Hampshire has plans for development of major recreational facilities.

Careful surveillance of both present and future recreational demands which are placed upon this project is necessary to formulate plans that will enhance public enjoyment and safety as well as protect the environmental resources. Over utilization of certain sites by picnickers or campers may necessitate development of supervised day-use and/or camping areas such as those outlined in the Master Plan. This reservoir contains considerable acreage and installation of developed sites will not necessarily eliminate areas of solitude where hiking, hunting, fishing and canoeing, can be enjoyed. "Developed" and "non-developed" recreational opportunities are not mutually exclusive considering that Franklin Falls contains over 3,000 acres of land and 500 acres of streams and river.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH
WOULD BE INVOLVED IN THE OPERATION AND MANAGEMENT PROGRAM

Extended flooding of the area after initiation of the growing season can cause a certain amount of tree mortality and terrestrial habitat loss. Mortality to birds and wildlife can also occur. These situations are neither irreversible nor irretrievable. Losses within the project area must in turn be balanced by the environmental disruption to downstream habitat and wildlife which may occur as a result of scouring floods.

VIII. COORDINATION WITH OTHER AGENCIES

The preparation of this Environmental Assessment was coordinated with several Federal, State and local interests including:

The Bureau of Sport Fisheries and Wildlife

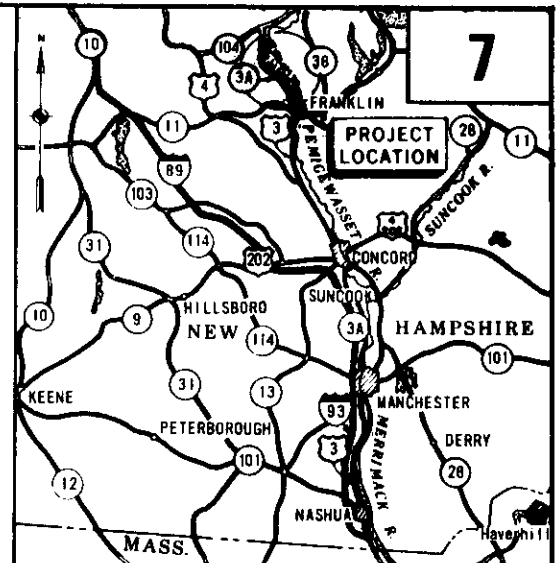
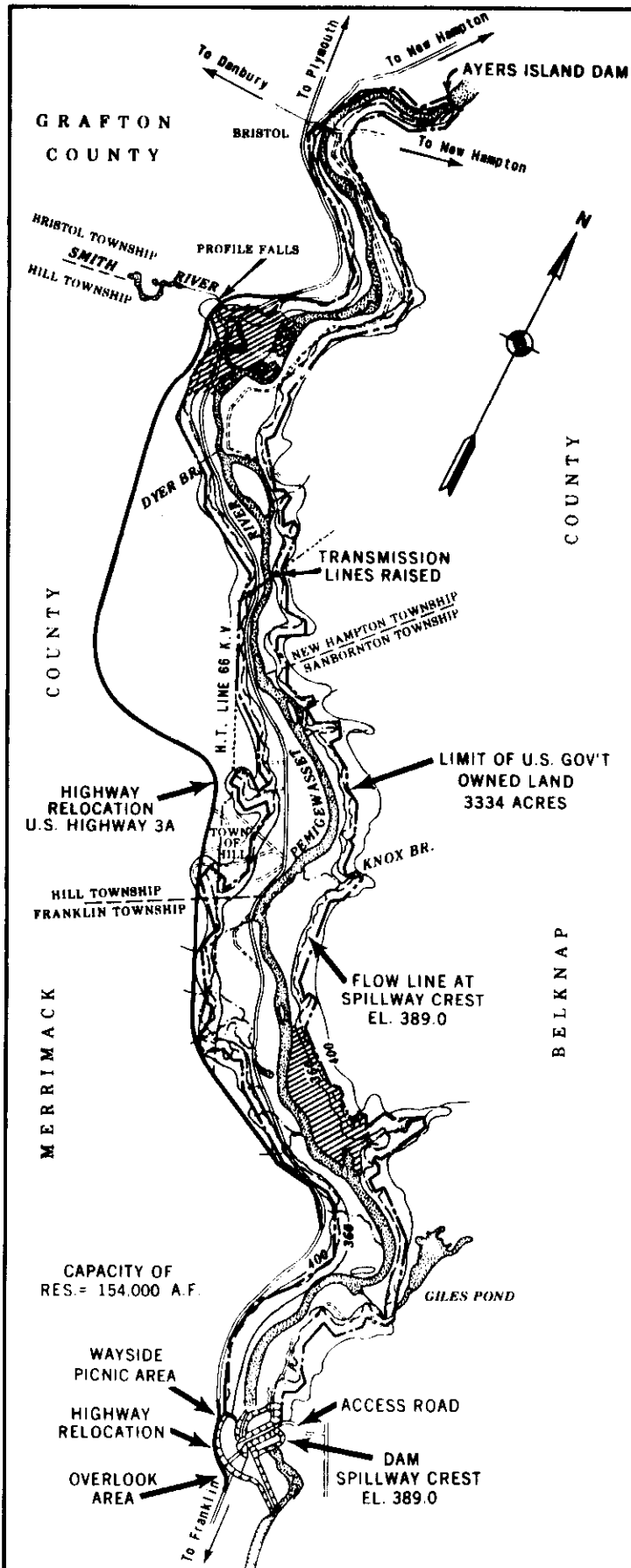
The N.H. Department of Resources and Economic Development

The N.H. Fish and Game Department

The N.H. Water Supply and Pollution Control Commission

The City of Franklin

The Towns of Sanbornton, Hill, Bristol and New Hampton



VICINITY MAP

SCALE IN MILES

10 0 10 20

MERRIMACK RIVER BASIN
FRANKLIN FALLS DAM AND LAKE
RESERVOIR MAP

30 JUNE 1970

PEMIGEWASSET RIVER

NEW HAMPSHIRE

SCALE IN FEET
 3000 0 3000 6000

NEW ENGLAND DIVISION

WALTHAM, MASS.